

AMENDMENTS TO THE CLAIMS

Please amend the claims of the present application as set forth below.

In accordance with the PTO's revised amendment format, a detailed listing of all claims has been provided. A status identifier is provided for each claim in a
5 parenthetical expression following each claim number. Changes to the claims are shown by strikethrough (for deleted matter) or underlining (for added matter).

Claims 1-4, 7-11, 14-17, and 19-21 were pending.

10 Claim 21 is canceled without prejudice or disclaimer.

No claims are added.

No claims are amended.

Accordingly, following entry of this Amendment, claims 1-4, 7-11, 14-17, and 19-20 are pending.

31
Claim 1 (Previously amended): A host bus adapter for interconnecting a computer system to a storage area network comprising:

- 5 hardware for transmission of frames;
hardware for reception of frames;
memory for storage of frames;
a processor for processing frames, the processor coupled to the hardware for transmission of frames, the hardware for reception of frames, and the memory for storage of frames;
wherein the processor is capable of inspecting frames for encapsulated
10 write requests and, if encapsulated write request frames are found, de-encapsulating the write request and forwarding the write request through the hardware for transmission of frames to a target node of the write request;
wherein the host bus adapter is capable of maintaining a mirrored dataset on at least two target nodes; and
15 wherein the host bus adapter is capable of determining that it has no direct path to one of the at least two target nodes, and, when no direct path exists, is capable of requesting that another node perform a surrogate write to the one of the at least two target nodes.

20 Claim 2 (Original): The host bus adapter of Claim 1, wherein the processor further inspects frames for responses to encapsulated write requests and, when such responses are found, forwards the responses to a source node from which the original encapsulated write request frames came.

25 Claim 3 (Original): The host bus adapter of Claim 2, wherein the host bus adapter is capable of simultaneous connection to at least two links, having a transmitter and a receiver for coupling to each link.

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Claim 4 (Original): The host bus adapter of Claim 2, wherein the host bus adapter is capable of responding to a query frame, the query frame containing a request for status of any path that might exist from the host bus adapter to a specified target node.

[5
Claims 5-6 (canceled)

Claim 7⁵ (Previously amended): A host bus adapter for interconnecting a computer system to a storage area network comprising

- 10 hardware for transmission of frames;
hardware for reception of frames;
memory for storage of frames; and
a processor for processing frames, the processor coupled to the
hardware for transmission of frames, the hardware for reception of frames, and
15 the memory for storage of frames;
wherein the processor is capable of inspecting frames for encapsulated
write requests and, if encapsulated write request frames are found, de-
encapsulating the write request and forwarding the write request through the
hardware for transmission of frames to a target node of the write request;
20 wherein the host bus adapter is capable of maintaining a mirrored
dataset on at least two target nodes including the target node of the write
request; and
wherein the host bus adapter is capable of scanning nodes to determine
a node capable of performing a surrogate write to the target node of the write
25 request.

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Claim ⁶~~8~~ (Previously amended): A node for connection to a storage area network comprising:

- hardware for transmission of frames;
- hardware for reception of frames;
- 5 memory;
- at least one processor for processing frames, the processor coupled to the hardware for transmission of frames, the hardware for reception of frames, and the memory for storage of frames;
- wherein the processor is capable of inspecting frames for encapsulated
- 10 write requests and, if encapsulated write request frames are found, de-encapsulating the write request and forwarding the write request through the hardware for transmission of frames to a target node of the write request;
- wherein the node is capable of maintaining a mirrored dataset on at least two target nodes; and
- 15 wherein the node is capable of determining that it has no direct path to one of the at least two target nodes, and, when no direct path exists, is capable of requesting that another node perform a surrogate write to the one of the at least two target nodes.

20 Claim ⁷~~9~~ (Original): The node of Claim ⁶~~8~~, wherein the processor further inspects frames for responses to encapsulated write requests and, when such responses are found, forwards the responses to a source node from which the original encapsulated write request frames came.

25 Claim ⁸~~10~~ (Original): The node of Claim ⁷~~9~~, wherein the node is capable of simultaneous connection to at least two links, having a transmitter and a receiver for coupling to each link.

30 Claim ⁹~~11~~ (Original): The node of Claim ⁷~~9~~, wherein the node is capable of responding to a query frame, the query frame containing a request for status of any path existing from the node to a specified target node.

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B/E
Claims 12-13 (Canceled)

- Claim ¹⁰~~14~~ (Previously amended): The node of Claim ⁶~~8~~, wherein the node is
- 5 capable of scanning nodes of a network to determine a node capable of performing a surrogate write to the one of the at least two target nodes.

11
Claim ~~15~~¹¹ (Previously amended): A computer network comprising:

- 21
a first node;
a second node;
a first target node;

5 a network interconnect providing communication between the first node and the second node, and providing communication between the second node and the first target node; and

a second target node and the network interconnect further provides communication between the second target node and the first node; and
10 wherein the first node is capable of maintaining a mirrored data set having a copy on the first target node and the second target node;
wherein the first node is operable to determine it has no direct path to one of the first and second target nodes, and when no direct path is determined, is operable to request the second node to perform a surrogate write to the one of
15 the first and second target nodes;

wherein the second node is capable of inspecting incoming frames for encapsulated write requests and, if encapsulated write request frames are found, de-encapsulating a write request from the encapsulated write request frames and forwarding the write request to the first target node; and

20 wherein the second node further is capable of inspecting frames received from the first target node for responses to previously forwarded encapsulated write requests and, when responses to previously forwarded encapsulated write requests are found, forwarding the responses to the first node.

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Claim ~~16~~¹² (Original): The computer network of Claim ~~15~~¹¹, wherein the second node is capable of responding to a path query frame with a status of a path from the second node to the first target node.

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Claim ~~17~~¹³ (Original): The computer network of Claim ~~16~~¹², wherein the network interconnect is fibre channel compatible.

B1 [Claim 18 (Canceled)

- Claim ¹⁴19 (Previously amended): A method of performing writes by a first node
- 5 of a storage area network to a mirrored dataset, the mirrored dataset comprising a first copy on a first storage node of the storage area network and a second copy on a second storage node of the storage area network, the storage area network having a surrogate-capable node, the method comprising the steps of:
- 10 checking a status of a first path from the first node to the first storage node and of a second path from the first node to the second storage node; if the first path has good status and the second path has bad status, then: performing a write to the first copy of the mirrored dataset over the first path;
- polling the surrogate-capable node to determine whether the surrogate-
- 15 capable node has a path having good status to the second storage node; if the surrogate-capable node has a path having good status to the second storage node, encapsulating a write request to the second copy and transmitting that encapsulated write request to the surrogate-capable node; and
- de-encapsulating the encapsulated write request to the second copy and
- 20 forwarding it from the surrogate-capable node to the second storage node.

- Claim ¹⁵20 (Original): The method of Claim ¹⁴19, further comprising the steps of:
- transmitting a response to the write request to the second copy from the second storage node to the surrogate-capable node, and of
- 25 forwarding the response to the write request from the surrogate-capable node to the first node.

[Claim 21: (Canceled)